REMARKS/ARGUMENTS

The claims 14-17 and 25-27. Claims 14-17 have been amended to better define the invention. Claims 22-24 have been canceled in favor of new claims 25-27. In addition, method claims 18-21 have been canceled without prejudice. Support for the claims may be found, *inter alia*, in the disclosure at page 10 and in the original claims. Reconsideration is expressly requested.

The Examiner objected to claims 22 and 23 as failing to comprise a combination of elements. In response, Applicant has canceled claims 22 and 23 in favor new claims 25-26, which it is respectfully submitted overcomes the Examiner's objection on the basis of this informality.

All claims were rejected as either anticipated (claims 14-18 and 20-21) or obvious (claims 19 and 22-24) over *McCulloch et al. U.S. Patent No. 6,450,024* alone (claims 14-21) or in view of *Lee et al. U.S. Patent No. 4,946,555* (claims 22-24) for the reasons set forth on pages 2-7 of the Office Action. Essentially, the Examiner's position was that *McCulloch et al.* discloses the device for determining flow parameters and the aspirative fire

recognition device and/or oxygen measurement device recited in the claims except for features which were considered within the skill of the art or disclosed by *Lee et al.*

In response, Applicant has amended claims 14-17 to better define the invention, has canceled claims 18-24, and has added new claims 25-27, and respectfully traverses the Examiner's rejection for the following reasons.

As set forth in claim 14 as amended, Applicant's invention provides a device for determining flow parameters in a fluid flow to be monitored. The device includes a thermoelectric air flow sensor that is operated in a constant temperature mode, a thermoelectric temperature sensor, and a regulation circuit for setting a predetermined excess temperature at the air flow sensor. The excess temperature defines a temperature difference between the temperature of the thermoelectric air flow sensor and the temperature of the fluid to be monitored. The regulation circuit is implemented in a microprocessor which contains a regulation algorithm and an evaluation algorithm. The regulation algorithm operates the air flow sensor with a constant excess temperature and the evaluation algorithm monitors fluid flow or

flow resistence in the pipe system. The evaluation algorithm recognizes that nongradual fluid flow changes not based on disruptive ambient influences.

As set forth in new claims 25-27, Applicant's invention provides an assembly including a pipe system for taking air samples from a target space and a detector for receiving the air samples from the pipe system. The assembly also includes a device for determining flow parameters disposed in the pipe system including a thermoelectric air flow sensor and a microprocessor programmed with a regulation algorithm for operating the air flow sensor with a constant excess temperature and with an evaluation algorithm for monitoring fluid flow or flow resistance in the pipe system. The evaluation algorithm recognizes nongradual fluid flow changes not based on disruptive ambient influences, and the excess temperature defines a temperature difference between the temperature of the thermoelectric air flow sensor and the temperature of the air samples.

As more specifically set forth in new claim 26, the detector includes an air entry channel having a center and the

thermoelectric air flow sensor is disposed in the center of the air entry channel. As more specifically set forth in new claim 27, the detector includes an air entry channel having a portion narrowed in cross-section and the thermoelectric air flow sensor is disposed in the portion narrowed in cross-section of the air entry channel.

In this way, Applicant's invention provides a device and assembly in which the excess temperature at the air flow sensor is kept constant so that the sensor may be precisely adjusted in its working temperature independent of variations or changes in the fluid temperature. As a result, the amount of heat taken from the thermoelectric air flow sensor actually corresponds only to the amount of heat taken from the fluid.

The primary reference to *McCulloch et al.* teaches a device for determining flow parameters, particularly the temperature and the flow velocity, in a fluid-flow to be monitored. For this purpose, *McCulloch et al.'s* device includes a heated resistence temperature detector (16) for measuring the mass flow rate of the fluid. In this respect, reference is made to column 7, lines 27 to 30 of *McCulloch et al.* where it is stated that "*...the heated*

resistance temperature detector 16 provides information representative of the mass flow rate of the fluid".

However, contrary to Applicant's invention as set forth in claim 14 as amended and new claims 25-27, *McCulloch et al.* fails to disclose or suggest a device or system which is suitable and adapted to determining the gradient of flow parameters, such as the gradient of the flow velocity or of the flow resistence. Although the Examiner has drawn the Applicant's attention to the Abstract of *McCulloch et al.* and further to column 7, lines 1 to 25, it is respectfully submitted that these text passages disclose only that *McCulloch et al.'s* system is suitable for *determining the mass flow rate of a fluid* (see Abstract and col. 7, lines 1-5). In addition, even if the application of *"probe stem loss information"* is disclosed in the Abstract of *McCulloch et al.*, this application of *"probe stem loss information"* acts only for recalibration of the system when operated in alternate fluids, not for determining the gradient of flow parameters.

Hence, *McCulloch et al.* fails to disclose or suggest a device for determining gradients of flow parameters such as changes of the temperature of the flow velocity or the flow

resistance. Furthermore, *McCulloch et al.* fails to disclose or suggest a system which is suitable and adapted for monitoring fluid flow or flow resistance in a pipe system in order to recognize nongradual fluid flow changes not based on disruptive ambient influences.

In addition, *McCulloch et al.* fails to disclose or suggest a device having a regulation algorithm for operating an air flow sensor with a constant excess temperature. In this respect, the Examiner's attention is drawn to the definition of "excess temperature" according to which the excess temperature defines a temperature difference between the temperature of the thermoelectric air flow sensor and the temperature of the fluid to be monitored.

In fact, *McCulloch et al.'s* system includes a heated resistance detector 16 for measuring the mass flow rate of the fluid and a reference resistance temperature detector 18 which is adapted for measuring the fluid temperature. In this respect, reference is made to column 7, lines 30 to 35 of *McCulloch et al.* where it is stated that "*...the reference resistance temperature detector 18 provides...an indication of the fluid temperature*".

Thus, in detail and with respect to the operation of the heated resistance temperature detector 16 and the reference resistance temperature 18, *McCulloch et al.* teaches to maintain the resistance temperature detector resistance ration R_H/R_C constant under all conditions (see column 6, lines 37 to 40). This teaching is also stated in equation (11), wherein R_H indicates the resistance of the heated resistance temperature detector 16, and wherein R_C indicates the resistance of the reference resistance temperature detector 18. However, the reference resistance temperature detector 18 has a linear, or nearly linear resistance temperature dependency within the expected temperature ranges of the fluid in order to provide a temperature signal representative of the ambient temperature of the fluid (see column 1, lines 47 to 52). On the other hand, the heated resistance temperature detector 16 also has a substantially linear resistance temperature dependency within an expected temperature range of the fluid (see column 1, lines 52 to 55).

Hence, in *McCulloch et al.* the difference between the temperature of the heated resistance temperature detector 16 and the temperature of the reference resistance temperature detector 18 is maintained constant, <u>not</u> the difference between the

temperature of the thermoelectric air flow sensor and the temperature of the fluid, as set forth in Applicant's claim 14 as amended, and new claims 25-27.

The defects and deficiencies of the primary reference to *McCulloch et al.* are nowhere remedied by the secondary reference to *Lee et al.* *Lee et al.* discloses an apparatus and method for measuring gas flow rates and parameters in pulp and paper processing in which a gas supply line 20 is connected to an oxygen line 44, and a device 52 for measurement and control of oxygen flow is disposed in line 44. There is no disclosure or suggestion of a device for determining flow parameters or an assembly which is suitable and adapted to determining the gradient of flow parameters, such as the gradient of the flow velocity or of the flow resistance. *Lee et al.* also fails to disclose or suggest a device or assembly which is suitable and adapted for monitoring fluid flow or flow resistance in a pipe system in order to recognize nongradual fluid flow changes not based on disruptive ambient influences or a device having a regulation algorithm for operating an air flow sensor with a constant excess temperature as set forth in Applicant's claims. Accordingly, it is respectfully submitted that the claims are patentable over the cited references.

In summary, claims 14-17 have been amended, claim 18-24 have been canceled, and new claims 25-27 have been added. A check in the amount of $100.00 is enclosed in payment of the fee for one independent claim in excess of three. In view of the foregoing, it is respectfully requested that the claims be allowed and that this case be passed to issue.

Respectfully submitted,
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